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New User Orientation

1.0 Introduction

This document gives new users a quick overview of the high-performance computing (HPC) environment operated by the NASA Advanced Supercomputing (NAS) facility at Ames Research Center. It contains all the basic information users must know to get started with the supercomputing resources and services provided at the facility. Returning users can use this guide for a quick refresher and find pointers to more advanced topics.

Links to NAS Knowledgebase articles for further details and advanced tips appear throughout the guide.

You can always contact the NAS Control Room staff 24x7x365 for additional help.

Toll-free Telephone: 800-331-8737
Local Telephone: 650-604-4444
E-mail: support@nas.nasa.gov

1.1 What You Need to Get Started

To make best use of this guide you must already have done the following:

- Completed the two-phase user accounts process for NAS systems
- Received your RSA SecurID fob
- Obtained your password and enabled your RSA SecurID fob for two-factor authentication
    - ♦ If you have not yet received instructions, call the NAS Control Room at the numbers shown above

1.2 Things to Remember

When you completed your Account Request Form, you also agreed to abide by a set of rules by signing an Acceptable Use Statement. Below are a few basic reminders.

- The computing systems are unclassified systems; classified information may not be processed, entered, or stored
- Users cannot divulge access information (for example, lists of user accounts)
- Users cannot share their account(s) with anyone, including sharing account passwords, providing access via a .rhost entry, or any other means of sharing - if you are found sharing accounts, your accounts will be disabled

- It is your responsibility to become familiar with various NASA security-related policies.

2.0 Environment Overview

Our HPC environment is operated by staff in the NASA Advanced Supercomputing Division at Ames Research Center located at Moffett Field, CA. The supercomputers and support staffing are funded by NASA's High-End Computing Capabilities (HECC) Project.

The sections below summarize the overall supercomputing environment, including secure network connections, front-end systems, and data storage facilities.

2.1 Capabilities and Components

The HPC environment provides the following capabilities and components, including integrated supercomputing support services, augmented by customizable support throughout the entire life cycle of your projects.

2.1.1 Secure Enclave

The enclave is a secure, networked area containing the following:

- High-performance computers (HPCs): Pleiades and Columbia
- Visualization system: hyperwall-2
- Secure front-end systems (SFEs) - provide inbound connection to the HPCs; two-factor authentication using your RSA SecurID fob is required when issuing commands such as **ssh**, **scp**, and **bbftp** for inbound connection via the SFEs
- Secure Unattended Proxy (SUP) - allows remote file transfers and other remote operations without typing a password and using your SecurID fob; instead, you can pre-authenticate, which allows automatic file transfers
- Mass storage systems (Lou1 and Lou2)

2.1.2 Supercomputers

The high-end computers at the NAS facility currently include Pleiades and Columbia. Brief system descriptions with links to more detailed configurations are given below.

Keep in mind that you have been given access to and allocations on specific systems - not all supercomputing resources are available for your use.

Pleiades

The NAS facility's newest system, Pleiades is an SGI Altix ICE 8200 EX cluster containing Intel quad- and hex-core processors.

- 111,872 total Intel cores (Harpertown, Nehalem-EP, and Westmere)
- 3 GHz processor speed (Harpertown), 2.93 GHz (Nehalem-EP), and 2.93 GHz (Westmere)
- 188 terabytes (TB) total memory
- 12 front-end nodes (Pfe1-12) and 2 bridge nodes (bridge1, bridge2)
- 1.315 petaflops (Pflop/s) peak; 1.09 Pflop/s sustained performance (June 2011)

The two bridge nodes, with larger amounts of memory and higher-speed network connections compared to the front ends, offer faster file transfers between Pleiades and Columbia or the Lou mass storage systems. The bridge nodes have 64-bit versions of IDL, MATLAB, and TecPlot installed and will run these applications much faster than on the front-end nodes.

Columbia

The Columbia system comprises SGI Altix 4700 compute servers contained in 40 cabinets.

- 4,608 Intel Itanium processors (Montecito, Montvale)
- 1.6 GHz processor speed
- 9 terabytes (TB) total memory
- 1 front-end node (cfe2)

2.1.3 Visualization System: hyperwall-2

The hyperwall-2 provides users with a supercomputing-scale resource to process very large datasets produced by the HPCs and NASA scientific instruments. Access to this system by general users is limited and requires special authorization.

- 128 high-end NVIDIA graphics processing units (GPUs)
- 1,024 AMD processor cores (Operton)
- 2 terabytes total memory
- Storage: 475 terabytes

2.1.4 Networks

To access the HPC resources, use the command **ssh** to connect from your desktop system to either a wide area network (either NREN or NISN) or to a host system to log into the NAS local area network, which provides access to the enclave via the secure front-end systems.

For remote users, two DMZ servers (DMZFS1, DMZFS2) are available for staging files between the enclave and the outside world. The DMZ offers authentication bastion hosts for accessing internal system resources, and also provides a file staging area for remote users who need to automate their transfers. The DMZ file servers provide limited storage (2.8TB

each) for temporary file storage for very short durations. Files older than 24 hours are automatically removed.

Two host systems (Bouncer and Bruiser) are gateways for local NAS users.

See network tools and file transfer tips for more information.

2.1.5 Mass Storage

The NAS high-performance computing environment includes mass storage systems Lou1 and Lou2, with about 45 petabytes (PB) of tape storage and over 7 PB of disk storage on the floor). This capability allow users to archive and retrieve data quickly and securely. Data stored on disk is migrated to tapes as needed.

The diagram below gives an at-a-glance view of the environment and its components.

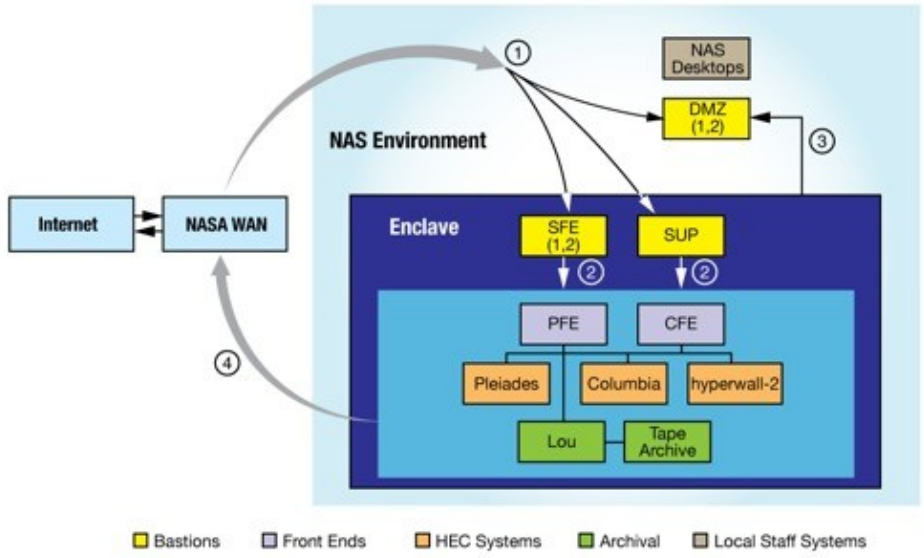

Figure 1: NAS login process. Numbered arrows denote the following: 1) Connect to a NAS bastion, 2) Connect to a front-end system or compute node, 3) Pull files from the Demilitarized Zone filesystem, 4) Traffic leaving NAS, outbound connections.

2.1.6 Other Capabilities and Services

The following support services are also offered free of charge to all users.

- Application performance optimization and code porting
- End-to-end network services for troubleshooting and performance
- Advanced scientific visualization and analysis capabilities

NAS User Support staff are available 24x7x365.

Toll-free Telephone: (800) 331-8737
Local Telephone: (650) 604-4444
E-mail: support@nas.nasa.gov

3.0 Basic Tasks

3.1 Logging in to HPC Systems

Once you have obtained your default password and activated your fob, you can to connect to the supercomputers.

Before you log in for the first time, you may want to browse through other articles listed in the computing overview.

Your subsequent logins to the supercomputers can be done using one of two methods; both require use of your RSA SecurID fob and connection through the SFEs, which are strictly for communication with systems in the enclave. Use of the SFEs should be limited to **ssh** or **ssh Passthrough**.

- Two-step connection from your desktop to the SFEs and then to resources within secure enclave; this is quicker but takes more time in the long run
- One-step connection via SSH Passthrough; this is the recommended method, even though it requires a bit more work initially to configure and maintain

IMPORTANT: With either of these methods, make sure you have a Secure Shell (SSH) that supports Protocol 2 on your local desktop system. If you do, skip below to the connection method of your choice. If not, download free OpenSSH connectivity tools.

TIP: OpenSSH 5.1 and above contains performance enhancements that could double your file transfer speeds over the WAN. You can check your version of OpenSSH by running the command **ssh -V** on your system. If it is older than version 5.1, an upgrade to 5.2 is highly recommended.
The examples below show how to connect to the HPC systems, using sfe1 as the secure front-end.

3.1.1 Two-Step Connection Method

IMPORTANT: The secure front-end systems are used only as gateways to the enclave resources and are not to be used for storing data.

```
Local% ssh nas_username@sfe1.nas.nasa.gov
sfe1%   ssh pfe1
```

3.1.2 One-step Connection Method

To use the faster, one-step method to connect to the enclave, you must first set up SSH Passthrough and the *.ssh/config* file on your local system. This takes more time initially, but

saves time in the long run.

IMPORTANT: If you have different usernames at the NAS facility and at your own site and want to use SSH Passthrough, you must add the following line to your *.ssh/config file* on your localhost if you want it to take effect for each host listed in the config file and if you do *not* want to use the command **ssh *nas_username*@pfe1**.

```
User nas_username
```

or

```
Host pfe1 pfe1.nas.nasa.gov
  ProxyCommand ssh nas_username@sfe1.nas.nasa.gov /usr/local/bin/ssh-proxy %h
```

For your convenience, we provide a downloadable *.ssh/config* template called config_nas.txt. After download, copy this file to your *.ssh* directory, replace <NAS_login_name> with your actual NAS login name in this file, and then rename this file to *config*.

See the security overview for links to additional related topics.

3.2 Submitting and Running Jobs

Now that you've done all the basic setup (and assuming your allocation is in place) you're ready to run jobs.

Allocations are specified in System Billing Units (SBUs). Note that when your allocation is expended, you will no longer be able to run jobs, and need to request more hours. You can check your remaining SBU balance by issuing the command **acct_ytd** on the system(s) where you have accounts.

```
% acct_ytd
```

3.2.1 Usage Charge Methods

Below is a simple explanation of how you are charged for system usage.

- **Front-End Systems**
  Usage of the front-end nodes is *not* charged. However, remember that these front-end nodes are meant for editing and/or compiling and running short testing jobs. If you misuse these systems, your jobs will be terminated.
- **Back-End Systems**
  Usage of the back-end nodes *is* charged. The number of SBUs charged to a job is the number of total wallclock hours used multiplied by the MAUs and the following SBU rates:

Pleiades (Westmere)	1
Pleiades (Nehalem-EP)	0.8
Pleiades (Harpertown)	0.45
Columbia (Itanium-2)	0.18

3.2.2 Understanding Queues

All NAS facility supercomputers use the Portable Batch System (PBS) to manage batch jobs. The available queues on different systems vary, but all typically have constraints on maximum wall-time and/or the number of CPUs allowed for a job. Some queues may also have other constraints or be restricted to serving certain users or GIDs. In addition, mission directorate limits are also set on the supercomputers. For more information, see the Pleiades Mission Shares Policy and the Columbia Mission Shares Policy.

The table below lists commands to view various types of queue information.

% qstat -Q % qstat -Qf	available queues and their constraints on a system
% qstat -W shares=-	mission shares for each mission on a system

3.2.3 Interactive Processing

All jobs run on the back-end nodes, either through an interactive session or a batch session, are done by issuing the **qsub** command to PBS, as described below.

To run a job interactively, use the command **qsub -I** (as in Interactive) in conjunction with the resources you request via the **-l** (as in "liquid") option. For example, to request 1 node with 8 CPUs and 1 wall-clock hour on Pleiades:

```
% qsub -I -lselect=1:ncpus=8,walltime=1:00:00
```

On Columbia, a similar resource request is:

```
% qsub -I -lncpus=8,walltime=1:00:00
```

3.2.4 Batch Processing

Before submitting a batch job, you must first create a PBS job script. Below is a sample script where the **select** option is used to request 4 nodes, 8 cores per node (indicated by **ncpus)**, and one hour of maximum elapsed time. Without an explicit request of a queue name, the job uses the default run queue.

```
#PBS -l select=4:ncpus=8
#PBS -l walltime=1:00:00
```

```
cd $PBS_O_WORKDIR

mpiexec -np 32 ./a.out
#end of script
```

To submit this job, issue the following command:

```
%qsub name_of_your_sample_script
```

3.2.5 Charging to a Non-default GID

For users who have access to more than one GID, only one of those GIDs is set as your default, which is listed in the /etc/passwd file(s) of the system(s) you have access to. Your jobs will be charged to the default GID unless you specify a different one.

For users who have access to more than one GID, only one of the GIDs is set as your default, which is listed in the */etc/passwd* file(s) of the system(s) you have access to. The default GID is the one that your jobs will be charged to unless you specify a different GID to use.

If you want to charge your usage to a non-default GID (for example, s0901), add the following to your PBS script:

```
#PBS -W group_list=s0901
```

3.2.6 Checkpointing

None of the HPC operating systems have automatic checkpoint capability. For jobs that need a lot of resources and/or long wall-time, you should implement a checkpoint/restart capability in the source codes or job scripts.

PBS automatically reruns unfinished jobs after system crashes or certain system issues. If you do not want PBS to rerun your job, make sure to add the following in your PBS script:

```
#PBS -r n
```

3.3 Managing Jobs

When a job is submitted to PBS, a job identification number (JOBID) is assigned. PBS jobs are usually in the Running (R) state or the Queued (Q) state. Use the following commands to find status and manage your jobs; using JOBID 12345 as an example:

%qstat	show the status of batch jobs
	list all jobs that belong to you

%qstat -nu
your_nas_username
%qstat 12345
or
%qstat -f 12345 check the status of a PBS job using the JOBID
%qstat -s 12345 show why a job is not yet running
%qdel 12345 delete a job
%qhold 12345 place a job on hold

Again, for jobs that need lots of resources and/or long wall-time, you should implement a checkpoint/restart capability in the source codes or job scripts.

See also common reasons for jobs not starting.

3.4 Storing Data

For each HPC system you have access to, you are given the following:

- A *home* directory to store a small number of files such as source code, small input files, etc.
- A *nobackup* directory to use for reading and writing large amounts of data while running jobs

For long-term data storage, you also have access to a home filesystem on one of the Lou mass storage systems.

3.4.1 Filesystem Overview

To find out if your home filesystem is on Lou1 or Lou2, log in to any of them, and run the command **mylou**. In the example below, your Lou home directory is on Lou2:

```
Lou1% mylou
Your Mass Storage host is lou2
Store files there in your home directory, /u/your_nas_username
```

For Pleiades, the actual disk that your */nobackup* directory resides on is one of /nobackup[10-60]. A sym-link is created so that you can simply type */nobackup/your_nas_username* to access your */nobackup* directory.

For Columbia, there are two types of */nobackup* directories. One is a local */nobackup* for each Columbia host that can *only* be accessed from a backend host (such as */nobackup[21-24]* for Columbia 21 - 24). The other is a CXFS */nobackup* (i.e.,/nobackup[1-2][a-i]).

Also note that the Columbia CXFS */nobackup[1-2][a-i]* filesystems are mounted on Lou1, Lou2 and Lou3. So, you can get access to data on these CXFS filesystems from the Lou system without logging in to any Columbia hosts.

To find out which */nobackup* you are assigned to on Columbia, type:

```
% ls -ld /nobackup[1-2][a-g]/your_nas_username
```

3.4.2 File Retention Policy (backup and nobackup)

All home filesystems (including the Lou systems) are backed up each night. These backups are stored for approximately one year.

WARNING: The *nobackup* file systems mean just that - they are *not* backed up. While this is stating the obvious, some users have lost important data by storing it on these systems. It is your responsibility to copy valuable data to your home directory or to archival storage on the Lou systems.

3.4.3 Mass Storage

The HECC environment includes two mass storage systems Lou1 and Lou2 (45 PB total storage capacity). These systems allow you to retrieve files quickly and securely. Data stored on disk is migrated to tapes as needed to make space for more data. Two copies of your data are written to two separate tape media in silos located in two different buildings.

NAS has no specified quota for mass storage space, but a limit of 250,000 files can be stored.

Data Migration Facility (DMF)

The Lou systems automatically write and retrieve data to and from tape. The data migration (disk-to-tape) and recall (tape-to-disk) are managed by SGI's Data Migration Facility (DMF) and Tape Management Facility (TMF).

You can log into the Lou systems like any other system and save data to mass storage by simply copying your files to your home directory on any of the Lou systems, referenced as louX:/u/your_userid, where X is 1 or 2. However, you will only have storage space on one of them. Use the command **mylou** to find out which Lou system you should store your data on.

You can manually copy files from your home filesystems (or any of the /*nobackup* filesystems of Pleiades or Columbia) to Lou for long-term storage (disk and/or tape archive).

See Data Migration Facility Commands for more information.

Storage Commands

Here are a few tips to make your mass storage transactions more efficient.

- Instead of using the command **ls** to list your files, use the command **dmls** to see whether the files are on tape (OFL) or on disk (REG or DUL).
- Use the command **du** to determine the data space of a directory, as shown below:

```
lou1 % du -ssh --apparent-size datadir
150G    datadir
```

- Use the command **du** with the **-apparent-size** option to see how much data is in a directory or a set of files.
- Use the command **dmget** to retrieve a set of files from tape all at once, as shown below:

```
lou2 % dmget data.200905* &
```

3.5 Transfering Files

This section provides information and available file transfer commands you can use to transfer files either between your desktop and the HPC systems or to transfer files between these systems. See the file transfer overview for more information.

3.5.1 File Transfer Commands

File transfer commands and their uses are summarized below.

Command	Use to	Benefits & Drawbacks	Performance
cp	Copy between any mounted filesystems of a host		
cxfscp	Copy between two mounted filesystems of a host; at least one of the filesystems is CXFS Transfer files between Lou systems and Columbia	Over cp: Uses multiple threads and large direct I/Os to get full bandwidth (about 4-7 times faster than cp for files over 2 gigabytes (GB)	Up to 400 megabytes per second (MB/sec)
scp			

	Secure copy between two hosts; both authentication information and data are encrypted		Within the secure enclave: 40-100MB/sec, depending on various factors
	Typically for transferring small files within the NAS facility (< 5GB) or offsite (<1GB)		For faster scp, use HPN-SSH or upgrade to OpenSSH 5.1 or newer
bbftp	File transfer between two hosts; authentication information is encrypted, data is unencrypted	Over scp: Can transmit multiple streams of data; possibly better transfer rate	Within the secure enclave: similar or better than scp (40-100MB/sec)
	Transferring large files (> 1GB) within NAS or offsite	Complicated syntax	Over WAN: up to 50MB/sec (may reach 100MB/sec to certain NASA sites)
bbscp	When you want bbftp functionality but with SCP-like syntax; in-house wrapper script for bbftp	Installed on all HPC systems (under /usr/local/bin)	Same as bbftp

3.5.2 Transfer Files Between Enclave and Outside

To transfer files between the enclave and the outside world, you can use the commands **scp**, **bbftp**, and **bbscp**. You may find that using **scp** to transfer large files over the WAN gives poor transfer rates - using **bbftp** and **bbscp** should provide better performance. A bbftp server and/or client software, and the bbscp script need to be installed on your system before you can use the **bbftp** or **bbscp** commands.

For inbound file transfers that are initiated from your local system to HPC systems, you will be prompted for (at minimum, depending on your setup) your SecurID when you issue the transfer command.

Outbound file transfers that are initiated from the HPC systems to your local hosts may be a better way to transfer files, if your local hosts allow it.

Below are three examples of initiating **scp**, **bbftp**, and **bbscp** from your local host, assuming that you have different usernames between your local system and the NAS systems:

Example 1:

```
Local% scp nas_username@lou1.nas.nasa.gov:foo ./foo
```

Example 2:

```
Local% bbftp -u nas_username -e 'setnbstream 2; get filename' -E 'bbftpd -s -m 2' lou1.
```

Example 3:

```
Local% bbscp foo nas_username@lou1.nas.nasa.gov:
```

3.5.3 Transfer Files Within the Enclave

To transfer files between supercomputers, you can use the commands **cp**, **cxfscp**, **scp**, **bbftp**, or **bbscp** (see table of commands, above). Most users transfers files among three systems - Pleiades, Columbia, and Lou.

If you want to transfer large amounts of data between Pleiades and another system, we request that you use the Pleiades bridge nodes to do the transfer. This is because the 10-Gigabit Ethernet (GigE) connections on the two bridge nodes are faster than the 1GigE connection (which can be saturated with a single scp) used on the Pleiades front-end nodes (pfe[1-12]). So, using the bridge nodes improves file transfers out of Pleiades.

Transfer Files Between Pleiades and Columbia Filesystems

Since the Columbia CXFS filesystems are mounted on the Pleiades bridge nodes, you can simply login to one of the bridge nodes and use the **cp** command to do the file transfer.

Transfer Files Between Pleiades and Lou

File transfers to the Lou systems will go over the 10GigE interface by default. The commands **scp**, **bbftp**, and **bbscp** are available to do file transfers; **bbscp** uses mostly the same syntax as **scp**, but performs faster. So, **bbscp** is recommended over **scp** if you do not require the data to be encrypted when sent over the network.

File transfers from the compute nodes to Lou must go through the front-end nodes (such as pfe[1-12], bridge[1-2]) first.

TIP: When sending data to Lou systems, please keep your largest individual file size under 1TB, as large files will keep all of the tape drives busy - preventing other file restores and backups.
To prevent the filesystems on Lou systems from filling up, please limit total data transfers to 1TB and then wait an hour before continuing. This allows the tape drives to write the data out to tape.

If you use bbftp or bbscp to transfer files to Lou systems, limit the number of streams to 2. Using a higher number of streams may thrash the Lou filesystems when multiple bbscp or bbftp connections are in process.

Transfer Files between Columbia and Lou

The Columbia CXFS filesystems are mounted on Lou. If you want to transfer files between a Columbia CXFS filesystem and Lou, you can use either the **cp** or **cxfscp** command on the Lou systems.

To transfer files between a non-CXFS filesystem and Lou, use the commands **scp**, **bbftp**, or **bbscp**.

4.0 Optimizing Workflow

This section provides additional basic tips on setting up your NAS environment to help make your workflow more efficient. For more detailed information, see also, Customizing Your Environment.

4.1 Setting up Your Environment

Setting up your environment to fit your needs makes it more convenient for you to use a system. This section describes what you need to know to set up your environment on the supercomputers.

4.1.1 Default Shell

When your account is created, your default shell is set to be *csh*; this is assumed to be the case throughout this guide.

If you want to use a different shell as your default, call the NAS Control Room at **1-800-331-8737** or **650-604-4444** or send an email message to support@nas.nasa.gov to request the change. Once the change is made, the new default shell of your choice applies to all of your NAS accounts on the various systems.

4.1.2 Module Commands

All NAS software uses a system called "modules" to centralize the location of licensed products from vendors or the public domain.

To use modules, be sure to include the following in your .cshrc file, which contains information that is read by the Unix shell (csh or tcsh) every time you log onto the computer or open a new terminal window:

```
source /usr/local/lib/global.cshrc
```

or use the following command if you want to use modules for your current session only.

```
%source /usr/share/modules/init/csh
```

The following are useful module commands to remember:

NAS Module Commands

```
module avail
```

	find out what other modules are available
`module list`	list the modules in your environment
`module purge`	unload all loaded module files
`module load module_name`	load new modules
`module switch old_module_name new_module_name`	switch between different versions of software
`module show module_name`	show changes to environment

4.1.3 Default Compilers and Software Modules

On Columbia, a set of default software (including Intel compilers, SGI's Message Passing Toolkit, and SCSL libraries) is loaded automatically. Use the command **module list** to determine which modules have been loaded for you. If you prefer to use a non-default version, use the module commands in the table above to change to other versions in either your .cshrc file, your job script, or at the command line, depending on which sessions you want the change to take effect in.

On Pleiades, no default software is loaded. If you want to have a compiler, MPI library, math library, etc. automatically loaded when you log in, use the **module load** command in your .cshrc or .login files. See also Customizing Your Environment for examples on how to set this.

4.2 Compiling Code with Intel Compilers

If you haven't used Intel compilers in the past, here are some commands to invoke the various versions:

`ifort` Intel Fortran
`icc` Intel C
`icpc` Intel C++
For example, to compile foo.f with ifort, type:

```
% ifort foo.f
```

Read the *ifort*, *icc* and *icpc* man page for options to use. Type **man *topic*** to access any man page.

4.3 Porting and Running MPI Codes with SGI's MPT Library

To build an executable for your Message Passing Interface (MPI) code, we recommend taking the following steps:

- At the link step, link your code with SGI's MPT library by adding the option **-lmpi**
- Use the command **mpiexec** to start the MPI process

Note that on Pleiades, you need to first load an Intel compiler module and an SGI MPT module.

The example below shows how to compile and link your code with MPT:

```
ifort -o foo foo.f -lmpi
```

For running your MPI codes with MPT in a PBS job, insert the following in your PBS script:

```
mpiexec -np xx foo
```

4.4 Managing Your Files

Quota Limits

Quota limits are enforced on all filesystems. Two kinds of quotas are supported:

- Limits on the total disk space occupied by a user's files
- Limits on how many files a user can store, irrespective of size. For quota purposes, directories count as files

Two types of quota limits are in place: hard limits and soft limits.

- Hard limits can never be exceeded - any attempt to use more than your hard limit will be refused with an error
- Soft limits can be exceeded temporarily
    - ♦ When you exceed your soft limit, you can continue to use your account on that system normally; however, you will receive a daily email message reminding you that you are over your soft quota limit, and you need to reduce your usage to below the soft limit
    - ♦ If you remain over your soft limit for more than the two-week grace period, the soft limit is enforced as a hard limit, and you will not be able to add or extend files or do any work (except removing files) until you get back under that limit

To check your disk usage and quota limits, use the command appropriate to the filesystem, as shown below:

Command	Filesystem
%quota -v	Columbia systems, Lou, and Pleiades home filesystems

```
% lfs quota -u your_nas_username
/nobackup/your_nas_username
```

Pleiades /nobackup filesystems

5.0 Other Resources

You can get additional information such as user announcements, updates on technical issues, and advanced techniques related to the NAS supercomputing environment from the following links:

- General User Information
- FAQ
- Knowledge Base Home